

IFWO

RAW SEQUENCE LISTING

DATE: 08/26/2004

PATENT APPLICATION: US/10/766,993

TIME: 11:37:09

Input Set : A:\-8-1.app

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3 <110> APPLICANT: Chang, Chia-Hwa
        Liu, Xiaowen
        Lewicki, John A.
        Xu, Qiang
        Osel, Inc.
9 <120> TITLE OF INVENTION: Surface Expression of Biologically Active Proteins in
10
        Bacteria
12 <130> FILE REFERENCE: 016976-000810US
14 <140> CURRENT APPLICATION NUMBER: US 10/766,993
15 <141> CURRENT FILING DATE: 2004-01-28
17 <150> PRIOR APPLICATION NUMBER: US 60/443,619
18 <151> PRIOR FILING DATE: 2003-01-29
                                                              (ps.6)
ENTERED
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22 <170> SOFTWARE: PatentIn Ver. 2.1
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27 <213> ORGANISM: Lactobacillus jensenii 1153
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35 <223> OTHER INFORMATION: CWA200 cell wall associated region with anchor
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51 Asn Lys His Phe Leu Tyr Leu Gln Ser Glu Gly Ser Ala Arg Asp Leu
                                40
54 Thr Ile Asn Gly Asn Gly His Arg Ile Asn Phe Ala Gly Tyr Ser Ile
                            55
57 Ala Leu Gln Asn Lys Asn Tyr Thr Asn Ala Ala Asn Pro Trp Asn Ile
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69 Tyr Gly 70 130	Glu Asn	Leu Pro	Val 135	His	Phe	Ala		Glu 140		Asn	Ile	Thr
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75 Lys Phe 76	Asp Ser	Gly As: 165	n Thr	Thr	Phe	Asn 170	Val	Asp	Gly	Lys	Val 175	Thr
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81 Ala Ser 82	Asn Ser 195	Glu As:	n Pro	Ser 200	Thr	Leu	Ile	Asn	Glu 205	Gly	Ala	Thr
84 Val Thr 85 210	Ile Asn	Ala Ly	Ser 215	Asp	Asp	Leu		Gly 220	Ile	Tyr	Ala	Gly
87 Arg Gln 88 225		23	5			_	235					240
90 Gly Thr 91		245				250					255	
93 Ser His 94	260				265					270		
96 Lys Gln 97	275			280				_	285		-	
99 Val Thr 100 290		Asn Gl	y Thr 295		Tyr	Ala	Pro	Ile 300		Leu	Gly	Val
102 Gly Pro	lle Ser		al Ala 10	a Ser	Pro	Leu	Ser 315		Gln	Thr	Val	Ser 320
105 Leu Ile							ت بد د					
TOO LOG II	e Asn Asr	n GIY S	er Lei	ı Thr	Ile	: Ile	Arg		Thr	Ala	Lys	Lys
106		325				330)	Asp			335	,
		325 5 Leu I				330 Asp)	Asp			335 Ser	,
106 108 Thr Let 109 111 Thr Thr	ı Val Pro 340 Leu Lys	325 5 Leu I 0	le Sei	Met L Gly	Gly 345 Ala	330 Asp) Gly	Asp Ser	Leu Leu	Ser 350 Asp	335 Ser	Asn
106 108 Thr Leu 109	val Pro 340 Leu Lys 355	325 Deu I Des Phe So	le Ser er Val	Met LGly 360	Gly 345 Ala	330 Asp Gly	Gly Ala	Asp Ser Thr	Leu Leu 365	Ser 350 Asp	335 Ser Leu	Asn Gln
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106 108 Thr Let 109 111 Thr Thr 112 114 Asp Lys 115 370 117 Asn Gly 118 385 120 Phe Let 121 123 Gly Thr 124 126 Gly Pro 127 129 Pro Asr 130 450 132 Gly Asr	Val Pro 340 Leu Lys 355 Ala Gly Leu Val Thr Pro 420 Thr Pro 435 Asp Val	325 Deleu I De	le Ser Val ary Val et Glu la Glr // Val 455	Met Gly 360 Tyr Gly L Asn Gly Trp 440 L Arg	Gly 345 Ala Gly Thr Leu 425 Asp	330 Asp Gly Ile Ser 410 Tyr	Gly Ala Gly 395 Arg Asn Gly Ile	Asp Ser Thr Pro 380 Thr Thr Ser Asn Ser 460	Leu 365 Ser Asp Gly Thr Lys 41a	Ser 350 Asp Thr Leu Asp Thr 430 Thr	335 Ser Leu Pro Leu 11e 415 Val	Asn Gln Glu 400 Arg Thr
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142			515					520					525			
	Asn	Phe		Phe	Trp	Ara	Pro		Ara	Met	Ala	Met		Ser	Lvs	Len
145		530			L	3	535	O	5			540	4 -1		-10	
	Asn		Asn	Pro	Asp	Val		Tle	Asp	Asp	Phe		Lvs	Tvr	His	Ala
	545	P				550	-1-				555		275	-1-	1110	560
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154				580	1		-1-		585		1		F	590		
	Ile	Thr	Asp	Phe	Lvs	Asp	Ile	Val		His	Val	Thr	Trp		Asn	Ser
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	625	2				630				-1-	635					640
165	Thr	Gly	Asn	Leu	Lvs	Thr	Thr	Asp	Glv	Phe	Ala	Trp	Ala	Lvs	Val	
166		•			645			L	. 1	650		Ľ		1	655	
168	Tyr	Ala	Asp	Gly	Ser	Val	Asp	Phe	Val		Ile	Pro	Leu	Lvs	Val	Thr
169	-		_	660			-		665	1				670		
171	Glu	Lys	Lys	Tyr	Ser	Glu	Glu	Leu	Thr	Pro	Ser	Tyr	Pro	Glv	Val	Ser
172		•	675	-				680				-	685	1		
174	Val	Glu	Gln	Gly	Lys	Ser	Asp	Ser	Val	Asp	Pro	Ser	Phe	Lys	Asp	Glu
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187			755					760					765			
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190		770					775					780				
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195	Gly	Ala	Val	Asp	Pro	Lys	Ala	Ala	Ala	Asp	Met	Pro	Glu	Gly	Ala	Ile
196					805					810					815	
198	Thr	Gly	Tyr	Glu	Lys	Gly	Asp	Phe	Asp	Ala	Pro	Ala	Gly	Val	Thr	Ile
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202			835					840					845			
204	Ala	Thr	Leu	Gly	Ser	Phe	Glu	Val	Pro	Val	Lys	Val	Thr	Tyr	Ser	Asp
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Output Set: N:\CRF4\08262004\J766993.raw

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	. 1								1305			0111		1310	1110	1110
	Thr									Glv	Tvr	Lvs			Val	Thr
292			1315			1100		1320	DCI	O T Y	+ y +		1325	110	Vai	1111
	Gly			Lvs	Tvr	Asn			Trn	Hic	Val			Λcn	Lau	7 an
295		1330		L 1 D	-1-		1335	1100	115	111.5		1340	DCI	чэр	пец	ASII
	Ala		Thr	Glv	Ser			Glu	ጥኒኒኒ	Thr			Sor.	T ~ T	Thr	Clar
	1345		1111	O L y	3	1350	Olu	Gru	тут		1355	FIO	261	vai		1360
	Tyr		Pro	Ser	Gln	2012	Lare	U=1	Glu			Thr	V-1	The		
301		1111	110		1365	Ата	пуъ	vai			гу	TIIL	vaı			GIU
	Thr	Glu	77.5			Val	Thr	т1.		1370	The	T	7		1375	т1.
304	1111	GIU		L380	ser	vai	1111			ıyı	Inr	ьуѕ			Asp	тте
	Dro	77-7			Tria	Drace	01		1385	a1	TT_ 7	7		1390	- 7	_
	Pro			ıyı	гув	PIO			Asp	GIY	vaı			Ата	rre	Asn
307			1395	m)	7	ml		1400		-	~1		1405	_		_
	Arg		vaı	Tnr	Arg			тте	Val	Lys			Gly	Lys	Glu	Pro
310		410	+1 .	m1	~ T		1415					1420				_
	Gln		тте	Thr			Val	His	Phe			GIu	Asp	Lys		_
	1425		~-3	_		1430		_			L435	_				L440
	Asn	Ser	GLY			Asp	Pro	Val			Glu	Ile	Lys			Thr
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322 324 325 ·327 328 330 331 333 334	Val Ile 1505 Asn Pro	Glu 490 Ser Lys	A15 Ala Tyr Asp Thr	Lys Thr Met Gly 540	Thr Lys Tyr L525 Lys	Val Asn 1510 Arg	Thr 1495 Ala Glu Ser	Ala Asp Val Thr	Glu Ile Thr Ser 545	Thr Pro Arg 1530 Val	Glu Val 515 Thr	Ala 1500 Pro Ile Thr	Ala Phe Asn Ala	Ser Asp Val Lys	Val Pro 1 Val .535 Phe	Thr Ser 1520 Asp
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322 324 325 327 328 330 331 333 334 336 337 339 340 342 343	Val 11le 1505 Asn Pro Arg Lys 1	Glu .490 Ser .Lys	Afsp Asp Thr Asp 555 Thr Val	Lys Thr Met Gly 540 Lys Met Glu	Thr Lys Tyr L525 Lys Asn Asn Gln	Asn 1510 Arg Ile Ser Pro Ile 590	Thr 1495 Ala Glu Ser Asn Trp 1575 Lys	Asp Val Thr Ala 560 Thr Gly	Glu Ile Thr Ser .545 Gly Pro Tyr	Thr Pro 1 Arg 1530 Val Tyr Ala Val	Val Sis Thr Gln Thr Lys Ala	Ala 1500 Pro Ile Thr Asp Gln 580 Lys	Phe Asn Ala Pro S65 Gly Val	Ser Asp Val Lys S50 Val Leu Asp	Val Pro 1 Val .535 Phe Thr Arg Gly	Thr Ser 1520 Asp Thr Gly Ala Asn 1600
322 324 325 327 328 330 331 333 334 336 337 339 340 342 343	Val 111e 1505 Asn Pro Arg Lys 1 Val 1585	Glu .490 Ser .Lys	Afsp Asp Thr Asp 555 Thr Val	Lys Thr Met Gly 540 Lys Met Glu Val	Thr Lys Tyr L525 Lys Asn Asn Gln	Asn 1510 Arg Ile Ser Pro Ile 590	Thr 1495 Ala Glu Ser Asn Trp 1575 Lys	Asp Val Thr Ala 560 Thr Gly	Glu Ile Thr Ser 545 Gly Pro Tyr Asp	Thr Pro 1 Arg 1530 Val Tyr Ala Val 1 Ser	Val Sis Thr Gln Thr Lys Ala	Ala 1500 Pro Ile Thr Asp Gln 580 Lys	Phe Asn Ala Pro S65 Gly Val	Ser Asp Val Lys S50 Val Leu Asp	Val Pro 1 Val .535 Phe Thr Arg Gly	Thr Ser 1520 Asp Thr Gly Ala Asn 1600
322 324 325 327 328 330 331 333 334 336 337 340 342 343 345 346	Val 11e 1505 Asn Pro Arg Lys 1 Val 1585 Val	Glu 490 Ser Lys Lys Glu Thr 570 Asn	A15 Ala Tyr Asp Thr Asp 555 Thr Val Ala	Lys Thr Met Gly 540 Lys Met Glu Val	Thr Lys Tyr L525 Lys Asn Asn Gln Ual	Asn 1510 Arg Ile Ser Pro Ile 590 Val	Thr 1495 Ala Glu Ser Asn Trp 1575 Lys	Asp Val Thr Ala 560 Thr Gly	Glu Ile Thr Ser 545 Gly Pro Tyr Asp	Thr Pro 1 Arg 1530 Val Tyr Ala Val Ser 610	Val 515 Thr Gln Thr Lys Ala 595 Ala	Ala 1500 Pro Ile Thr Asp Gln 580 Lys	Phe Asn Ala Pro S65 Gly Val	Ser Asp Val Lys S50 Val Leu Asp Val	Val Pro Val 535 Phe Thr Arg Gly Val 615	Ser 1520 Asp Thr Gly Ala Asn .600 Thr
322 324 325 327 328 330 331 333 334 336 337 340 342 343 345 346	Val 111e 1505 Asn Pro Arg Lys 1 Val 1585	Glu 490 Ser Lys Lys Glu Thr 570 Asn	Affa Ala Tyr Asp Thr Asp 555 Thr Val Ala	Lys Thr Met Gly 540 Lys Met Glu Val	Thr Lys Tyr L525 Lys Asn Asn Gln Ual	Asn 1510 Arg Ile Ser Pro Ile 590 Val	Thr 1495 Ala Glu Ser Asn Trp 1575 Lys	Asp Val Thr Ala 560 Thr Gly Pro	Glu Ile Thr Ser 545 Gly Pro Tyr Asp	Thr Pro 1 Arg 1530 Val Tyr Ala Val Ser 610	Val 515 Thr Gln Thr Lys Ala 595 Ala	Ala 1500 Pro Ile Thr Asp Gln 580 Lys	Phe Asn Ala Pro S65 Gly Val Met	Ser Asp Val Lys S50 Val Leu Asp Val	Val Pro Val 535 Phe Thr Arg Gly Val 615	Ser 1520 Asp Thr Gly Ala Asn .600 Thr
322 324 325 327 328 330 331 333 334 336 337 349 342 343 345 346 348 349	Val 11e 1505 Asn Pro Arg Lys 1 Val 1585 Val Ile	Glu 490 Ser Lys Lys Glu Thr 570 Asn Asp	A175 Ala Tyr Asp Thr Asp 555 Thr Val Ala Tyr	Lys Thr Met Gly 540 Lys Met Glu Val Gln 620	Thr Lys Tyr L525 Lys Asn Asn Gln Val .605 Ala	Val Asn 1510 Arg Ile Ser Pro Ile 590 Val Asn	Thr 1495 Ala Glu Ser Asn 1 Trp 1575 Lys Thr	Asp Val Thr Ala 560 Thr Gly Pro	Glu Ile Thr Ser 545 Gly Pro Tyr Asp Glu 625	Thr Pro I Arg I 530 Val Tyr Ala Val Ser 610 Gly	Val 515 Thr Gln Thr Lys Ala 595 Ala	Ala 1500 Pro Ile Thr Asp Gln 580 Lys Asn	Phe Asn Ala Pro S65 Gly Val Met Ile	Ser Asp Val Lys S50 Val Leu Asp Val Thr 630	Val Pro 1 Val 535 Phe Thr Arg Gly 1 Val 615 Val	Thr Ser 520 Asp Thr Gly Ala Asn 600 Thr
322 324 325 327 328 330 331 333 334 336 337 349 342 343 345 346 348 349	Val 11e 1505 Asn Pro Arg Lys 1 Val 1585 Val	Glu 490 Ser Lys Lys Glu Thr 570 Asn Asp Thr	A175 Ala Tyr Asp Thr Asp 555 Thr Val Ala Tyr	Lys Thr Met Gly 540 Lys Met Glu Val Gln 620	Thr Lys Tyr L525 Lys Asn Asn Gln Val .605 Ala	Val Asn 1510 Arg Ile Ser Pro Ile 590 Val Asn	Thr 1495 Ala Glu Ser Asn Trp 1575 Lys Thr Lys	Asp Val Thr Ala 560 Thr Gly Pro	Glu Ile Thr Ser 545 Gly Pro Tyr Asp Glu 625	Thr Pro I Arg I 530 Val Tyr Ala Val Ser 610 Gly	Val 515 Thr Gln Thr Lys Ala 595 Ala	Ala 1500 Pro Ile Thr Asp Gln 580 Lys Asn Asn	Phe Asn Ala Pro S65 Gly Val Met Ile Asn	Ser Asp Val Lys S50 Val Leu Asp Val Thr 630	Val Pro 1 Val 535 Phe Thr Arg Gly 1 Val 615 Val	Thr Ser 520 Asp Thr Gly Ala Asn 600 Thr
322 324 325 327 328 330 331 333 334 336 337 349 343 345 348 349 351 352	Val 11e 1505 Asn Pro Arg Lys 1 Val 1585 Val Ile Lys	Glu 490 Ser Lys Lys Glu Thr 570 Asn Asp Thr	A75 Ala Tyr Asp Thr S555 Thr Val Ala Tyr 1 Thr 635	Lys Thr Met Sly 540 Lys Met Glu Val Gln 620 Val	Thr Lys Tyr L525 Lys Asn Asn Gln Val 605 Ala	Val Asn 1510 Arg Ile Ser Pro Ile 590 Val Asn Asp	Thr 1495 Ala Glu Ser Asn Trp 1575 Lys Thr Lys	Asp Val Thr Ala 560 Thr Gly Pro Pro Ala 640	Glu Ile Thr Ser .545 Gly Pro Tyr Asp Glu .625 Asp	Thr Pro Arg 1530 Val Tyr Ala Val Ser 610 Gly	Val S15 Thr Gln Thr Lys Ala 595 Ala Gln	Ala 1500 Pro Ile Thr Asp 580 Lys Asn Asn Lys	Phe Asn Ala Pro S65 Gly Val Met Ile Asn Asn 645	Ser Asp Val Lys S50 Val Leu Asp Val Thr 630 Lys	Val Pro Val 535 Phe Thr Arg Gly Val 615 Val Asp	Thr Ser 1520 Asp Thr Gly Ala Asn 600 Thr Lys Asp
322 324 325 327 328 330 331 333 334 336 337 349 343 345 348 349 351 352	Val Ile 1505 Asn Pro Arg Lys 1 Val 1585 Val Ile Lys Leu	Glu 490 Ser Lys Lys Glu Thr 570 Asn Asp Thr	A75 Ala Tyr Asp Thr S555 Thr Val Ala Tyr 1 Thr 635	Lys Thr Met Sly 540 Lys Met Glu Val Gln 620 Val	Thr Lys Tyr L525 Lys Asn Asn Gln Val 605 Ala	Asn 1510 Arg Ile Ser Pro Ile 590 Val Asn Asp	Thr 1495 Ala Glu Ser Asn Trp 1575 Lys Thr Lys	Asp Val Thr Ala 560 Thr Gly Pro Pro Ala 640	Glu Ile Thr Ser .545 Gly Pro Tyr Asp Glu .625 Asp	Thr Pro Arg 1530 Val Tyr Ala Val Ser 610 Gly	Glu Val 515 Thr Gln Thr Lys Ala 595 Ala Gln Ile Glu	Ala 1500 Pro Ile Thr Asp 580 Lys Asn Asn Lys	Phe Asn Ala Pro S65 Gly Val Met Ile Asn Asn 645	Ser Asp Val Lys S50 Val Leu Asp Val Thr 630 Lys	Val Pro Val 535 Phe Thr Arg Gly Val 615 Val Asp	Thr Ser 1520 Asp Thr Gly Ala Asn 600 Thr Lys Asp

RAW SEQUENCE LISTING ERROR SUMMARY

PATENT APPLICATION: US/10/766,993

DATE: 08/26/2004 TIME: 11:37:10

Input Set : A:\-8-1.app

Output Set: N:\CRF4\08262004\J766993.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:9; Xaa Pos. 3

Seq#:29; Xaa Pos. 3

Seq#:30; Xaa Pos. 3

Seq#:31; Xaa Pos. 3,6

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/766,993

DATE: 08/26/2004 TIME: 11:37:10

Input Set : A:\-8-1.app

L:1221	M:341	W:	(46)	"n"	or	"Xaa"	used,	for	SEQ	ID#:9	after p	os.:0
L:1527	M:341	W:	(46)	"n"	or	"Xaa"	used,	for	SEQ	ID#:29	after	pos.:0
												pos.:0
L:1566	M:341	W:	(46)	"n"	or	"Xaa"	used,	for	SEQ	ID#:31	after	pos.:0